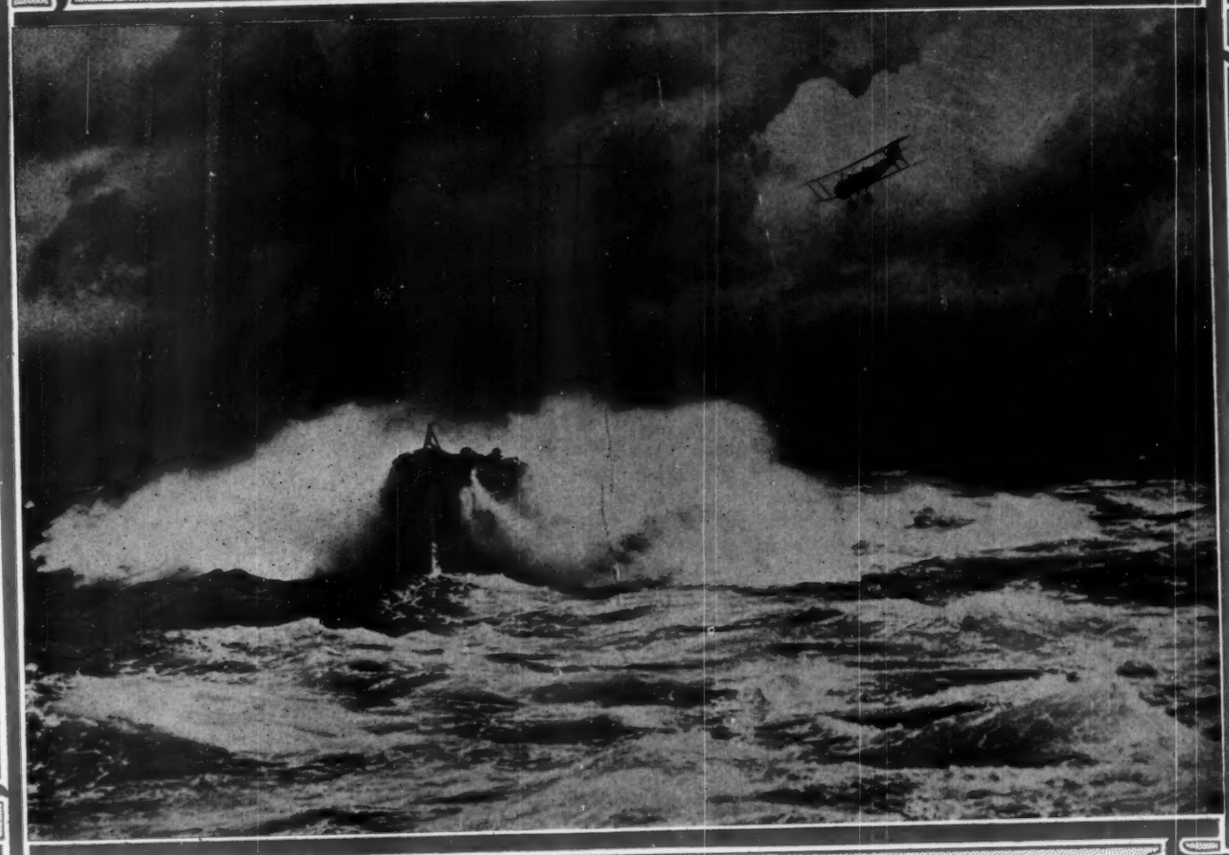
AVIATION

The Oldest American Aeronautical Magazine

AUGUST 3, 1925 Issued Weekly PRICE 10 CENTS



Rough going afloat

VOLUME XIX

NUMBER 5

SPECIAL FEATURES

AIRLINE COSTS

PRATT & WHITNEY AIRCRAFT CO.

NAVY-MACMILLAN EXPEDITION SCHEDULE

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 23, 1920, at the Post Office at Highland, N. Y. under Act of March 3, 1879.

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AUGUST 3, 1925

AVIATION

VOL. XIX. NO. 5

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Curtiss

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Let the Operator Keep Faith with the Public

The public demand for the transportation of passengers, mails and express matter by the air route places a definite responsibility upon all those who are studying the problem of air operation.

There seems to be no question that companies now organized will receive the sympathetic support of the public in exact proportion to the judgment, experience and honesty which they exercise in their pioneer operations. The greatest care must be used in organizing along practical and conservative lines. The success or failure of this enterprise will depend largely on two factors, personnel and equipment.

PERSONNEL. The personnel will be found available among that group of airmen produced by the war who are devoting their lives to the application of aviation to civilian needs.

EQUIPMENT. Obviously the Aircraft Operating Companies, not themselves designers or builders, must select their equipment from the best which the aircraft industry can supply.

The Curtiss Aeroplane & Motor Company, the oldest airplane and motor producer in the country, and the organization that has been the creative and productive source of the best military airplanes and motors, has directed its creative energy toward the commercial problem. It was the first company to design, build and test an airplane for the specific requirements of the Air Mail Service. The Curtiss Carrier Pigeon was at once accepted by the Post Office. The expert committee of the National Air Transport, Inc., after a coast-to-coast survey of available equipment, recommended the Curtiss Carrier Pigeon, and the company at once placed an order for a quantity of these machines.

As interchangeability of parts with consequent reduction in cost of maintenance was an important factor in the selection of the Carrier Pigeon by one company, so standardization of airplanes of one type and of one manufacturer by the Post Office and the leading operating companies will make efficient and economical operation possible. The use by all pilots of one type, the standardization of interchangeable spare parts for general distribution from Curtiss stores throughout the country, and the reduced price of planes and parts through centralized quantity production will make the Carrier Pigeon the standard commercial airplane. For "feeder lines" the Curtiss Lark, a smaller prototype of the Pigeon, will shortly be available.

CURTISS AEROPLANE & MOTOR COMPANY, INC.

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VOL. XIX AUGUST 3, 1925 No. 5

State or Federal Regulation

AIRCRAFT is not alone in having its problems of proper state or federal regulation. Recently, in Washington, the motor bus operators discussed their difficulties. It appears that approximately thirty states have passed laws requiring a bus operator to secure a certificate of public convenience and necessity authorizing him to operate. But the Supreme Court in three decisions this year has laid down as a principle of law, that regulation of interstate commerce is something inherently beyond the power of a state. Applying this principle, the court held the state laws to be unconstitutional to the extent that they sought to give state authorities power to regulate the entering into interstate business, to the unrestricted engagement of all persons desiring to operate bus lines through two or more states.

It would appear from the statements made by representatives of the motor bus operators that they prefer state regulation to that of a federal bureau. They believe that the people of the United States prefer that the regulation be under their direct local control than from a long distance bureau located in Washington.

One of the motor bus manufacturers said, "There is nobody in the country today who is more excited about the failure of having any regulation of interstate motor-vehicle common carriers than the operators themselves. They realize that if they are to be a public utility they must in return have a regulation of rates, service, safety and other regulations for protection against unwarranted competition. Therefore it is not necessary to attempt to regulate the independent operator in interstate commerce. He is today crying for regulation; he is trying to figure out the best way in which he can operate his business under fair legitimate regulation. It seems to us that the interstate motor-vehicle common carrier is a local transportation problem. We believe that the question of the regulation of rates, routes, safety and other matters should be left to the public utilities commissions of the states through which the operation is carried on. We believe that in such operations there may be differences of opinions between the public utilities Commission of the various states and that, therefore, the Interstate Commerce Commission should act as an arbiter in determining their difficulties."

This point of view should be of interest not only in connection with the future of the Winslow Bill but to the railroads, the electric railways as well as the motor vehicle common carriers. It may be found that aircraft cannot be regulated as simply as has been proposed, by a minor bureau of the Department of Commerce. The very simplicity of the proposed method of directing the future of air transport in this country may be its weakest feature. With motor vehicle operators and the radio industry seeking a solution for their problems, many new factors will enter into the aircraft situation. It is for these reasons that AVIATION has not been urging hastily prepared federal regulation. The claim that capital would not enter the air transport business until it was regulated has been disproved by the National Air Transport, the Ford Airline and other prospective aircraft ventures. Aircraft must take its place alongside of other common carriers and the sooner the regulatory difficulties of all are considered jointly, the quicker will a satisfactory solution be reached.

The Maximum Danger Point

IN the pioneer days, flying was done only in very slow airplanes on perfectly calm days and over a smooth field. Later, cross country flying was attempted and finally aircraft were flown in windy weather. The progress of flying, under increasingly difficult conditions, is continuing. No storm less than a hurricane prevents a flier from completing his scheduled flight, and night flying has become part of the routine. But the problems of flying through fog and thick weather have not, as yet, been solved.

A statistician, trying to present graphically the dangers of flying, would have to take into account the various stages of flying which have been attempted. The fundamental basis for his calculations would be the number of miles flown per fatal accident, but in his figures he would have to take into account the ever expanding utility of the airplane. The number of miles flown per fatal accident have shown a continual increase in spite of the greater difficulties which the airplane has been required to overcome. If the risk of flying a present day airplane over an airdrome in calm weather were calculated, it would be found to be practically nil, but man has never been content with such limited use, and as rapidly as the plane became perfected, he has dared to go a little beyond its limitations. As a result, what was a risky experiment one year has become commonplace the next. The danger curve has reflected this pioneering spirit and shows a much smaller number of miles per accident than would have been the case had pilots been more conservative. Aircraft are, however, rapidly reaching the maximum danger point in the flying of very fast planes at night, irrespective of weather. When this is accomplished the danger curve will reflect directly the improvements in the safety of aircraft and their operation.

Man has always asked the airplane to do a little more than the state of its development warranted. The most difficult operating conditions have almost been reached, and as there will be comparatively little of this class of flying, a constant improvement in the average safety of flying may be expected.

Airline Investment and Operating Costs

Some Elements of Air Transport Costs as Applied in Estimates Compiled by A. & D. R. Black for Barber & Baldwin Inc., and Several Other Clients

By ARCHIBALD BLACK

Consulting Aeronautical Engineer

From time to time, during the past few years, the writer and his associates have been called upon to make unusually thorough studies of air transport investment and operating costs. While space considerations make it impossible to cover this most interesting subject in detail the following notes on some of the elements should interest many. The cost data given were compiled in connection with studies of airplane operation under strictly commercial conditions in the United States, *the routes carrying mail and packages but no passengers. The figures herein represent numerous quotations and may be applied with little or no modification to any route of the type mentioned.*

In certain cases it has been necessary to omit the actual cost figure, giving only a reference to the method of obtaining it, because the cost in question is either subject to constant modification or incapable of general application and the figure would only prove misleading. In the matter of "crashes" and the losses resulting therefrom, a somewhat involved method of calculation was found necessary in order to obtain accurate data. This was based largely upon the actual experience *of the U. S. Air Mail Service as to number, damage, labor and material required, but it was not based upon the Air Mail* costs. *The impracticability of adequately covering it here made its omission advisable. As regards the number of employees and the resulting payroll, it was found necessary to thoroughly investigate this for each project. No way seems clear by which this information could be presented in digested form, suitable for general use, consequently it is necessary to also omit this very important item. However, before passing on it might be well to mention that the payroll, in each study, was divided into: (a) Operating; (b) Maintenance; (c) Local business offices and (d) Executive. The payroll for each of these divisions was developed from a very complete analysis of the work which was required to be done and was based upon definite assignments of every employee. While this may appear to be a lengthy method, a thorough analysis indicated that it was the only trustworthy one.*—AUTHOR.

Station fields at each of the cities are estimated as averaging a 2000 ft. by 2000 ft. plot (92 acres) of suburban property. In the cases of small operations these would be leased, with 25 and 50 airplanes per day headway they would be purchased. Probable cost about $1500. per acre or $138,000.00 each.

Between each of the station fields and at about 25 mi. apart along the route, emergency landing runways consisting of narrow L, X or T plots (Black system) would be provided. In the case of 25 and 50 airplanes per day headway these would be increased in number and their spacing decreased to about 12.5 mi. The plots would average about 1250 to 1500 ft. lots about 250 to 300 ft. wide, or 13 to 18 acres each. Average possibly 15 acres. These would be located in the open country where ground cost is low and may be estimated at not over $200. per acre. Cost about $3,000.00 per plot.

In the case of operating 1 to 5 airplanes per day, there would be ample room at a terminal for all of the shops and they could be either so located or could be distributed at two or three of the fields. In the case of 10 airplanes per day, part of the shops may be located at a terminal and part at certain other fields. In the case of 25 and 50 airplanes per day, it will be necessary to purchase additional ground for the shops without regard to where they are to be located as the fields will be used to near capacity for other purposes. Accordingly, 12 and 24 acres were estimated for shop erection in the case of 25 and 50 airplanes per day. Cost, suburban property class, $1500.00, per acre.

It may be assumed that the station fields are nearly level and that the only grading required will be the removing of mounds, filing of ditches, etc. It may be also assumed that the emergency runways would not require levelling as their area (each) is small and it is not essential that they be level. The following allowances were made for levelling of fields:

1 to 5 airplanes per day allowed $1,000.00 per field.
10 to 50 airplanes per day allowed $2500.00 per field.

The following allowances were made for surface drainage of the station fields: In the case of 1 to 5 airplanes per day, average drainage equals complete drainage of two 100 ft. by 2500 ft. runways at 3 out of 7 fields. Total cost 34.4 acres at $200.00 per acre, $6880. In the case of 10 airplanes per day, drain one quarter of the three fields. Total cost, $23 \times 3 = 69$ acres, at $200.00 per acre, $13,800.00. In the case of 25 and 50 airplanes per day, allow for drainage of one half of the same three fields. Total cost, 46×3 acres $=$ 138, at $200.00 per acre, $27,600.00. These allowances take into consideration the probable condition of the fields and also the amount of traffic. They should be liberal as it will be quite possible to find many fields where no drainage is required, unless the traffic is very heavy.

Allowances were made for the construction of roadway at fields to connect hangars, etc. Costs based upon gravel or similar cheap roadways 16 ft. wide.

For the construction of surfaced runways the following allowances were made. These were based upon probable necessities of fields and several estimates of cost:

1 airplane per day, surface two runways 50′ x 750′ at one field only. 8,330 sq. yd. @ 56c Total	$4,670.00
2 airplanes per day, surface two runways 50′ x 750′ at three fields. 25,000 sq. ft. @ 56c Total	$14,000.00
5 to 10 airplanes per day, surface two runways 75′ x 1000′, three fields, 50,000 sq. yd. @ 56c Total	$28,000.00
25 airplanes per day, surface two runways 75′ x 1000′ at each of 7 fields. 116,600 sq. yd. @ 56c Total	$65,200.00
50 airplanes per day, surface two pairs of two runways, each 75′ x 1000′ at each of seven fields. 233,200 sq. yd. @ 56c Total	$130,400.00

It was assumed that all of the airplanes in service or in reserve would be housed in hangars and that they were of average dimensions. No machines were figured as being of the folding type and the adoption of this type would materially decrease the hangar costs, particularly for large scale operations. As alternating the direction of airplanes in hangars permits better use of the floor space, this was assumed in every case. Estimated on the basis of two rows of airplanes in hangars 85 ft. to 90 ft. wide. The costs were calculated as follows: Steel hangar, all materials, with one coat paint, Erection on piers, material and labor, Cinder or gravel floor, 6 in. rolled, Lighting, Final coat of paint and incidentals; Total Cost (Average of numerous quotations) $1.25 per sq. ft.

Airplane Shops

The airplanes in these shops were divided into two classes: (1) those in the shops for engine overhauls or changing and (2) those in the shops to be rebuilt. Those being repaired after crashes, were included in the second class. The first class of machines were allowed space on the same basis as those housed in hangars. The buildings used for protection of these machines while engines are being removed or replaced are estimated at $1.25 per sq. ft. and would be of the same type construction as the regular hangars, having cinder or gravel floors, no heating and only general lighting. The space for airplanes being overhauled or rebuilt is calculated upon the basis of the required output of machines per week. As few figures on repair shop output were available, the floor space was also calculated upon the basis of the number of machines in the shop at one time, and the two figures com-

pared. These were also compared with the floor space required for regular airplane factories for equal output and the areas appeared to be close approximations.

These shops were estimated as being lighted, heated and having wood floors, and some plumbing, the costs being as follows: Material for standardized steel building; Erection on piers, labor and material; Wood floor on cinders and sleepers; Lighting and power outlets; Heating; Plumbing; 2 coats paint and incidentals; Total Cost (Average of several quotations) $2.05 per sq. ft.

In estimating the floor space required for engine shops, the allowance was made for 50 per cent of the engines being merely stored while awaiting attention or awaiting return to service. Engines stored occupy about 30 sq. ft. of floor while each engine being overhauled required about 200 sq. ft. Thus the average space per engine is 115 sq. ft. of floor space. To provide space for stockroom and for storage of reserve engines, 150 sq. ft. was allowed per engine. It was assumed that engine testing would be done in the open air as is customary. Engine shops were estimated on the basis of $2.10 per sq. ft., an increase of 5 cents per sq. ft. being allowed over the cost of the airplane shops, to cover the additional cost of a wood block floor. Otherwise the engine shops were similar to the airplane shops.

The floor space required for garages was developed on the basis of the trucks and automobiles required as developed from a detailed study. No allowance was made for tractor housing as these are few, occupy little space and can be left in the open under tarpaulin covers. Garages were planned for definite arrangements of cars and standard size of buildings, as they cannot be estimated correctly by allowing a standard area per car and assuming that a building can be arranged to suit. As some of the cars and trucks would always be out and the full numbers have been figured in the floor area estimates, the repair space was assumed to be provided in this manner. The cost of garages was estimated on the following basis excepting that slight increases were allowed in the case of the very small building: Standardized steel building, ready painted; Erection on piers, labor and material; 5 in. concrete floor, finished; Lighting; Heating; Final paint and miscellaneous; Total cost (Average of several quotations) $2.00 per sq. ft.

For the handling and temporary storage of packages under consignment, warehouses were planned for each station field. These buildings were estimated to take the full capacity of all airplanes arriving at or leaving the field for two days. The buildings are estimated as unheated and costing as follows: Standardized steel building, one coat paint; Erection on piers, labor and materials; Wood floor on cinders and sleepers; Lighting; 2 coats paint and incidentals; Total Cost (Average of several quotations) $1.55 per sq. ft.

The office space at station fields was estimated on the basis of the number of office employees plus an allowance for pilot's lockers, etc. The cost of buildings were estimated on the following basis for sectional wood, or similar, building with wood floors, heat, light, etc. erected on posts and ready for occupancy:

Buildings less than 500 sq. ft.	$2.75 sq. ft.)	
Buildings of about 500 sq. ft.	$2.50 " ")	Averages of
Buildings of 600-2500 sq. ft.	$2.25 " ")	Several quotations.
Buildings over 2500 sq. ft.	$2.10 " ")	

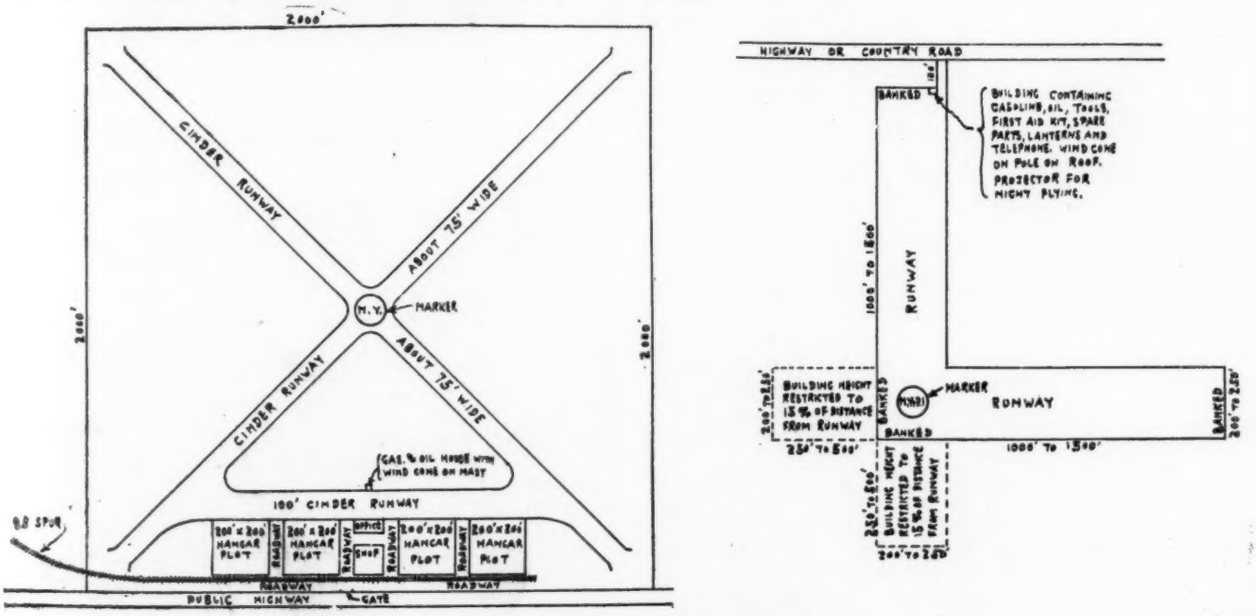
For gasoline and oil houses very small standardized steel buildings of the type used for small garages were proposed. These were estimated at $250.00 each, in place.

The assumption was made that the average station field will require extension of light and power lines for about one quarter mile. It was assumed that an extension of telephone lines averaging about one half mile would be necessary at each station field and emergency field. Quotations were obtained and costs worked out in detail for the various conditions and scales of operation.

At each station field either wells would have to be driven or the water lines extended according to local conditions and costs. It was assumed that the sinking of wells, would be the worst condition as the costs of water line extensions show that 550 ft. of 2 in. mains could be laid for the cost of one well. Wells are allowed for each station field, it being assumed, in the case of one airplane daily, that only three wells are required. If water supply is not conveniently available at other fields, it could be carried as required.

Some fencing being required at fields, allowances were made for average conditions, detailed lists developed for the various scales of operation and quotations obtained on these.

Allowances were made for preliminary engineering work and surveys of route, selection of fields, etc. and for the supervision of construction as follows: Selecting emergency fields and negotiating leases, etc. Selecting station fields, negotiating leases, etc. Selecting sites for beacons, arranging rights, etc. General engineering and surveys of preliminary class. Supervision of construction and engineering of field layouts.



Typical station and emergency field layouts

The number of airplanes required in each project was determined from a detailed study in which every machine to be owned by the proposed airline was definitely located at some point in the system, either in service, reserve or undergoing repair in one of the shops. Investigation showed this

to be the only practicable method of ascertaining the number actually necessary. Airplanes without engines or equipment were estimated at $15,000.00 each, based upon quotations and manufacturing cost data.

The numbers of engines required were determined by studies similar to those made for the airplanes. Engines were estimated (based upon quotations) as follows:

600 hp. Modern American engines $10,000.00 each complete.
400 hp. Liberty engines purchased from the U. S. Government, overhauled, parts replaced to bring them up to date, total cost $3,000.00 each complete.

For each machine there was allowed $1000.00 for radio telephones (based on two thirds of war price) and $200.00 for instruments, accessories, etc., which are not included in the original cost of the airplane. These costs were assumed to decrease with larger purchases.

A detailed study was made of the number of motor trucks required to carry the total capacity of all airplanes arriving at each station field each day. Quotations were then obtained on several well known makes, in various capacities, and cost schedules developed. At least one automobile has to be allowed for each city for handling of documents and similar special matter and at least one for the use of the local agent and his force. These numbers have to be increased with the larger scale operations. Tractors have to be provided for both maintenance work on the fields and for hauling "dead" airplanes around.

Estimates were compiled in complete detail, listing each item of equipment required, for the smallest airplane shop and the largest shop in a series. The various costs were then assumed to vary between these limits for the intermediate sizes of shops. The costs were based upon the floor areas for the airplane repair shops but are sufficiently liberal to include what limited equipment is required in the hangars in which airplanes are kept while their engines are being changed or overhauled.

Estimates were compiled in complete detail, listing each item of equipment, for the smallest and the largest engine shop as was done for the airplane shops. The equipment required for the intermediate sizes of shops was then assumed to vary between these limits.

As with the airplane and engine shops, costs were also compiled for the garage equipment by listing every item of equipment for the largest and the smallest garage, an 800 sq. ft. and a 6000 sq. ft. garage being used as examples of these. The costs were found to vary only slightly and were sufficiently consistent to justify the use of a flat allowance per sq. ft. of floor space without regard to size.

Office Equipment

Detailed estimates of the cost of furniture and small equipment required for offices indicated that a flat allowance per office employee could be used with safety. The assumption was made that large quantity purchases as well as more efficient use of equipment would enable scaling this cost down in the case of the largest scale operations.

Typewriters were assigned in accordance with an estimate of the portable requirements of the employees and totals developed. Adding machines and calculators were assigned in accordance with the estimated requirements of the force as were the typewriters. Duplicators, multigraphs, etc. equipment were allowed somewhat arbitrarily in accordance with what would appear to be the requirements of the force and considering that considerable circularizing would be constantly necessary to stimulate business.

An underground tank was assumed used at one field in the case of operating only one airplane per day. In all other cases, underground tanks are provided at every station field, some having more than one, in accordance with requirements. Portable oil tanks were allowed for in all cases and the provision of underground oil tanks started with the headway of five airplanes per day. Gasoline and oil would be stored in the original barrels where no other means of storage are provided.,

The sum of $250.00 per field was allowed in all cases to cover the cost of meteorological apparatus. This was based upon quotations covering a detailed list of instruments.

(To be concluded)

General Patrick Reappointed

Acting Secretary of War Davis has recommended and President Coolidge has approved the reappointment of General Patrick for four years more as Chief of Air Service. General Patrick's present term ends Oct. 4, 1925.

General Patrick was born at Lewisburg, W. Va., on Dec. 13, 1863. He was appointed to the Military Academy from West Virginia. Upon his graduation from West Point on July 1, 1886, he was assigned to the Corps of Engineers and served continuously in that arm until he was made Chief of Air Service. Among other assignments, he was a member of the Board of Officers which supervised the raising of the Battleship Maine. He also served as Commandant of the Engineer School, and was Chief Engineer of the American Forces in Cuba, 1906-08.

Mason M. Patrick

At the commencement of the World War, General Patrick was assigned as Chief Engineer of the Line of Communication and afterwards became Director of Construction and Forestry. On May 29, 1918, he was designated by General Pershing as Chief of the Air Service of the A.E.F. His services in that capacity brought him wide distinction in all the Allied Armies. He was appointed Chief of the Air Service of the United States Army with the rank of major general, Oct. 5, 1921. General Patrick is the holder of the Distinguished Service Medal, and is a Knight of the Order of the British Empire, a Commander of the French Legion of Honor; a Commander of the Italian Order of St. Maurizio and St. Lazzaro; and a Commander of the Belgian Order of Leopold. His Distinguished Service Medal citation follows:

"For exceptionally meritorious and distinguished services. He displayed much ability and devotion as Director of Construction and Forestry, and later, as Chief of the Air Service of the American Expeditionary Forces, he perfected and ably administered the organization of this important department."

Pratt and Whitney Aircraft Co. Formed

To Manufacture Aircraft Engines

On Wednesday, July 22, 1925 application was made for the incorporation under the laws of Delaware of The Pratt and Whitney Aircraft Company. The officers are as follows: Fred B. Rentschler, President; George J. Mead, Vice President and E. L. Morgan, Secretary and Treasurer. The new company intends to engage in the manufacture of aeronautical engines. The capitalization includes $2,000,000 of preferred stock and 20,000 shares of no par value common stock.

Fred B. Rentschler

The factory and officers of the company will be located at Hartford, Conn. It will occupy part of the manufacturing facilities of the Pratt and Whitney Company which was formerly the Pope-Hartford motor plant. The new aircraft company will be owned jointly by the Pratt and Whitney Company, experienced personnel who had had previous experience in the aeronautical industry and other important manufacturing interests.

The new company has issued the following statement of its plans and purposes:

"After very careful consideration, New England and Hartford were determined upon for the location of this enterprise, due to the splendid manufacturing conditions of this section and their well known and merited reputation for fine mechanics and their experience in all kinds of precision work. The Pratt & Whitney Company since 1869 have enjoyed an unsurpassed reputation for the development and manufacture of the highest grade machinery, small tools, gauges and precision measuring equipment. The splendid resources of this plant and organization can be utilized to exceptional advantage in the specialized and exacting field of aeronautical engines.

"Interest in the aeronautical field should be stimulated on account of the decision of manufacturing interests of long and successful standing to become active in it. Military aeronautics have become an established necessity. With this realization by every important foreign government it is highly desirable that every effort is made to keep our aeronautical achievement on a superior basis to that which obtains anywhere else. In addition, commercial development is making slow but steady progress and in time cannot be denied its place in our transportation problem. The outstanding need of successful commercial aviation is, improved flying equipment. The principal factor for the necessary dependibility is, the engine. It is toward this goal that the principal efforts of the Pratt & Whitney Aircraft Company will be directed."

The president, Fred B. Rentschler has been active in the aeronautical field since 1918. During the war he was a captain in the Air Service being assigned to the Bureau of Aircraft Production which was in charge of the production of aeronautical engines and aircraft for the government. Later he became District Manager of Aircraft Production, for the New York District. After the war he joined the Wright Aeronautical Corp. and became president, resigning the latter part of 1924. Mr. Rentschler was born at Hamilton, Ohio on Nov. 8, 1887 and is a graduate of Princeton University.

George J. Mead

The vice-president of the Pratt and Whitney Aircraft Company is George J. Mead who will be in charge of the Engineering work of the company. Mr. Mead after graduating from the Massachusetts Institute of Technology in 1916, became an engineer for the Sterling Engine Company at Buffalo and later joined the Simplex Automobile Company at New Brunswick, N. J. When the latter company became the Wright-Martin Aircraft Corporation, Mr. Mead was engaged from 1916 to 1919 in the development and manufacture of the French-Hispano aeronautical engines for the government. In 1919, he became Engineer-in-Charge of the Power Plant Laboratory of the Engineering Division of the Army Air Service at McCook Field, Dayton. In 1919, he returned to the Wright Aeronautical Corporation, the name having been changed, and has been chief engineer until he resigned to become vice-president of the Pratt and Whitney Company.

Navy-MacMillan Schedule

Detailed Plans for Handling the Loening Amphibians Under Arctic Conditions

Lieut. Comdr. R. E. Byrd, U.S.N., in command of the Naval detachment of the MacMillan Arctic Expedition under the auspices of the National Geographic Society, has forwarded the Navy Department a definite plan of operations with the three Loening amphibian planes in exploring the polar regions, plans for the establishment of bases, and the difficulties and precautions necessary in airplane expeditions in that climate.

Spectacular dashes will be avoided and the unit will feel its way as it goes as the difficulties facing them are unknown, but as far as possible emergencies will be provided for.

The base on the Polar Sea will be either at Cape Columbia, Grant Land, or Cape Thomas Hubbard, Axel Heiberg, depending upon which seems to afford the best landing places en route. It is known that there are landing facilities at the two above mentioned capes.

The Bases

In regard to the bases at Cape Columbia or Cape Thomas Hubbard, both of these locations face directly on the Polar Sea, with a million square miles of unexplored territory, extending out to the north and northwest. In this unexplored area, at an undertermined distance in the Polar Sea is the supposed location of Crocker Land which Admiral Peary thought he saw from Cape Thomas Hubbard. One of the most interesting tasks before the Naval Air unit will be to decide whether or not Admiral Peary saw a body of land never reached by man.

To load an airplane to the limit is hard on its engine as too many revolutions per minute are required to get the proper speed of the plane causing lessened reliability of engine performance.

The question of engine strain is of particular importance in operating under new conditions. One of the important results of this work in the Arctic by Navy planes will be the accumulation of data on the effect of the Arctic summer climate on aircraft engines. If airplanes in the future are to take advantage of the shorter routes through the Arctic regions, between points in Europe, America and Asia, the experiences of Commander Byrd will be of great value in the solution of problems incidental to air travel via the top of the earth.

Intermediate Base

An intermediate base will be formed between the main base at Etah and the base on the Polar Sea. Etah is the northernmost town in the world, and is located near the north-western tip of Greenland on Smith Sound, a northern arm of Baffin Bay. This base should be midway between the two bases or about 150 mi. from Etah. Ammunition, firearms, engine fuel and food will be put at both bases and in addition the base on the Polar Sea will have a small tent, some food and spare parts, radio operator and radio set, smoke bombs, field glasses, Primus stove, kerosene, planes' stakes and lashing for bad weather and one Eskimo and dog. The Eskimo and dog are taken along as an emergency measure in case it becomes necessary to live in the country. At least two months' supply of food will be taken to the base on the Polar Sea.

If the Polar Sea base is put at Cape Thomas Hubbard the first long flight over the Polar Sea will probably be 319 deg. true course. This rhumb line is a spiral but it does not get very ominous until very near the pole. It passes over problematical Crocker Land—the land which Peary thought he saw from Cape Thomas Hubbard, but which has been called a mirage. The second course will probably be 294 deg. true. From Cape Columbia the first course will probably be 281 deg. true, and the second 305½ deg. true. It is not practicable to attempt to predict any course other than these due to the impossibility of foreknowledge of conditions to be encountered.

Great attention will be given toward informing the Department by radio of the character and course of every flight prior to its start.

In order to steer the rhumb line given above variations as high as 180 deg. will be encountered and changes of variations of about 5 deg. will have to be made every 20 mi. of travel. The ground speed therefore will have to be carefully calculated with the course and distance indicator disc after having obtained the wind drift angle from the drift indicator.

The deviation in the steering compasses of the amphibian planes has been found to run as high as 80 deg. due to the location of the switches. These compasses (if they work at all) will have to be checked during the flight with the Navy 5-in. boat compass which has been placed in the rear cockpit. If neither of these magnetic compasses can be used due to the small component of the earth's horizontal magnetism (as is likely to be the case) the Earth Inductor Compass will be used. The compass is much more sensitive than the magnetic compass and probably will be useful.

All compasses will be checked by the sun compass and when the sun is bright this compass may be used entirely as the other compasses are subject to the errors of the theoretical variation which will be out as much as 5 or 10 deg. from the actual variation. In this case the sun compass will be set to the middle meridian of the area to be traversed for that will give approximately a straight line and only one course to steer and the only change will be that of leeway. Then every twenty miles the magnetic compasses will be checked with the sun compass and their variations recorded so that if the sun goes behind a cloud the return can be made with the earth inductor or the other compasses.

Navigating Details

As an aide in navigating, a small amount of a solution of permanganate of potash will be dropped on the snow every fifteen minutes. Radio compass bearings like the mid-meridian course of the sun compass is also approximately a straight line on the polar projection and this can be used very staisfactorily to give a cut (and so a fix) with the Sumner line of position. The latter can be readily ascertained from the pole as the computed point taking advantage of the fact that at the pole the altitude and declination can for any instant be taken out of the Nautical Almanac. The altitude of the observer's position can be obtained with the artificial horizon sextant. It is sufficiently accurate to draw the Sumner line thus obtained as a straight line on the polar projection. Prior to each flight the deviations of the compasses for the course to be steered will be checked at the base by sun azimuths.

At Etah the wings cannot be put on two of the planes on the steamship *Peary* on account of lack of space. Erecting the planes will therefore be a major operation. Approximately ten days of steady work will be required to erect planes, make test radio flights, reconnoitering flights, etc. Another week (if everything goes well) will be required to form the advanced base. It will therefore be past the middle of August when the first flight is made out over the Polar Sea. The return to the main base should be about Sept. 1.

No long flights over the Polar Sea will be attempted until short flights have been made to ascertain Polar Sea conditions. All three planes will be used to form the base on the Polar Sea. Two planes will go together on flights from this base and the third plane will remain at the base as a reserve plane. All three planes will be equipped with radio. At least one of the two planes flying over the Polar Sea must have a mechanic on board to repair the engine if possible in case of a forced landing. All members of the Naval unit are being required to learn to send and receive radio.

The plane left at the base should have assigned to it a competent navigator and before each flight he will be given

all details relating to the course to be steered so that rescue work can be competently carried on. Only two persons can go in each plane in the Polar Sea flights. On account of the extra gasoline tanks necessary there will not be room for navigation carrying a third person. Also a third person would cut down too much the radius of action of the plane.

The following equipment will be carried in each plane on the Polar Sea flights: Emergency tools; Gasoline and oil to depend upon the length of the flights to be made. At least an hour and a half reserve should always be carried; A month's food supply, primus stove and waterproof matches; Two sleeping bags; One air-raft (boat) with bellows and paddles; Radio; Anchor; Ice axe; Smoke bombs; Chart and sextant; Sun, earth inductor and magnetic compasses. Also a small pocket compass for possible hiking; Drift indicator and course and distance indicator; Permanganate of potash; Sideral and G.M.T. watches; Emergency medical outfit; Revolver and ammunition; Stakes and lashings for possible storms; Marine glue; Field glasses.

Possible Landings

Two of the most important factors that must be taken into consideration in connection with airplane flights over the Polar Sea are the questions of available landing places and the weather. The first problem of available landing places can be best determined by actual observation from the air of the nature of the surface in this area. The amphibious nature of the planes to be used, enabling them to alight in either water or on solid surfaces, will simplify this problem to a considerable degree. It was this characteristic that led to the selection of the planes carried by the party. From information obtained from Arctic explorers, it is to be expected that numerous "water leads" or lanes of open water exist in the Polar Sea. This will permit the use of the planes as seaplanes. Level stretches of snow or ice will be used for landing with wheels. But no extended flights where the necessity for landing will be likely to occur will be made until short observation flights disclose the exact nature of the surface of the region. The question of weather conditions may be decided to a considerable degree from weather observations taken at the base, but short preliminary flights will show the various temperatures and wind conditions that may be expected at various altitudes.

Flights in Pairs

Commander Byrd plans to operate the planes in pairs, the third plane remaining at the base as a reserve. By flying in pairs the possibility of disaster to the personnel will be greatly reduced. In the event of one of the planes being forced down and unable to take the air again, the companion plane, alighting in a favorable spot as near to the damaged plane as possible, could take on board the crew of the first plane and continue in flight. The third plane at the base, in constant readiness for the flight, is an extra precaution to insure the safety of the members of the party.

The greatest attention has been given to the radio equipment of the party, and with all members able to make use of it, the question of communications, whether for sending in reports of the operations, for navigation purposes, or for emergency use, should be well taken care of.

The list of equipment to be carried on each plane while on flights over the Polar Sea provides for every possible aid while in flight, or in case the plane lands, either for purposes of exploration or in case of a forced landing.

With the food supply and stove, sleeping bags, revolver for shooting game, and using the body of the plane as a shelter the crew of a plane unable to take the air should be able to get along fairly well for a very extended period, a period certainly much longer than would be necesary for a relief party to reach them with one of the other planes. The "air-raft" is a boat capable of supporting two men, its buoyancy being supplied by the rim of the craft, which is inflated with air by a small hand bellows carried for the purpose. In this boat, supplied with paddles and a small sail, the crew should be able to go where the "water leads" permit. The value of the "air-raft" would be particularly great should the rescue plane be unable to land near the disabled plane, and it became necessary for the crew of the disabled plane to reach the rescue plane by way of numerous water leads. Because of its slight draft and narrow width, the air-raft could be navigated in water much too narrow for a plane to operate. With the air out, and folded in a bag carried for the purpose, the air-raft makes a very small bundle, weighing only 10 lb.

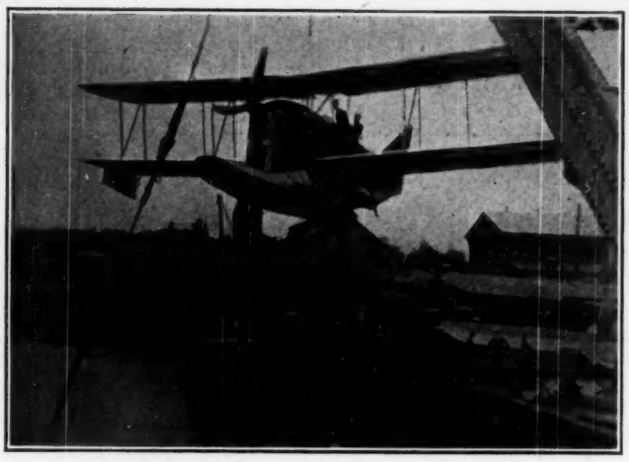


Photo Underwood & Underwood

The Loening Amphibian, NA1, of the MacMillan-Navy expedition being loaded on the U.S.S. Peary

Amundsen in his recent experiences with airplane north of Spitzbergen demonstrated that the ice axe is an indispensable part of the equipment. The ice axe forms a part of the equipment of each plane of the Naval air unit.

The potassium permanganate and smoke bombs are very important aids in navigating a plane over unfamiliar country where well known land marks do not exist. By dropping two smoke bombs while in flight, and sighting back along the line of the two columns of smoke formed by the bombs, it becomes possible to steer a straight course over a region totally unknown, even should the navigating instruments prove useless. The potassium permanganate when dropped from the plane on the snow or ice would form a large violet colored mark. By making a series of these marks a trail leading back to the start of the flight would be made, much like the line of bits of paper dropped in a game of "hare and hounds."

Earth Inductor Compasses

As the magnetic pole is located in northern Canada in the Gulf of Bothnia, north of Hudson Bay, hundreds of miles south of the North pole, and south of all the airplane operations of the Naval air unit in the Polar Sea, the conventional magnetic compass will be of little use. As the sun is always visible in the extreme North during the summer months, and describes an easily plotted circle, through the sky, the "sun compass" for direction finding based on this fact will be one of the main reliances of the party for navigation. Earth inductor compasses, much more sensitive than the usual compass operated electrically and so located in the planes as to be free as possible from the magnetic influence of the electrical equipment with the engine, and the standard magnetic compasses will be carried, not only for the aid in navigation that they may give, but also for experimentation in the effect upon compasses of those types in extreme northern latitudes. These compasses will be checked frequently with the sun compass. A specially designed sextant, with an artificial horizon, designed for use in planes in flight will be carried to enable the navigator of each plane to note his position in latitude and longitude. Radio signals from the base will also be very valuable in determining position, and will be used in connection with a radio compass which discloses the direction of the signals.

"Who's Who in American Aeronautics"

The second edition of "Who's Who in American Aeronautics" will be published Sept. 1, 1925. Below will be found new biographies that will appear in the forthcoming volume. An invitation is extended to all pilots actively engaged in aviation military, naval or commercial to send their biographical sketches for insertion in the next issue. The book will contain the biographies of practically all the leading persons in American aeronautics. The price of the book will be two dollars. Orders are being taken in advance as the edition is limited.

William L. Moose, Jr.

MOOSE, WILLIAM L., Jr., Major, Air Service; born, Morrilton, Ark., Sept. 12, 1881; son of William L. Moose and Laurie P (Brigan) Moose; married, Mary A. Donohue, Sept. 12, 1919.

Educated: Hendrix College, Conway, Ark., 1899 to 1903.

Professional: Cadet, U. S. M. A., 1903 to 1907; 2d. Lieut 15th Cav., 1907 to 1914; Graduated, Mounted Service School; 1912 to 1914; 1st Lieut. 9th Cav., May to Nov., 1914; 5th Cav., Nov. 1914 to February 1916; Capt. 15th Cav., August 5, 1917; Major, A. S. Sig. Corps, Aug. 5, 1917 to August 26, 1918; Lieut. Col., Same, August 26, 1918 to April 25, 1919; Major, A. S., July 1, 1919 to date.

Aeronautical Activities: Flying Instruction, Rockwell Field, April 12 to August 16, 1918; J. M. A., July 1, 1918; on duty office of Dir. Mil. Aeronautics, August 26 to Nov. 1, 1918; Executive, Mitchell Field, Nov. 9, 1918 to March 1, 1919; C. O., same, March 1, 1919 to Aug. 14, 1920; C. O. A. S., Supply Depot Richmond, Va., August 15, 1920 to August 1, 1922; Air Service Executive for organized Reserves of the 2nd Corps Area from July 1, 1923 to date with station in New York City

Flying Rating: J. M. A. and Airplane Pilot.

Member: Army & Navy Club, Washington, D. C.

Address: 39 Whitehall St., New York City; home, Kingston Ave., Bayside, N. Y.

Alexander A. Pedu

PEDU, ALEXANDER A., Engineer; born, Paris, France, May 13, 1891; son of Ambroise Pedu and Aimee (Herault) Pedu; married, Marguerite Bammann, Nov. 26, 1924.

Educated: School of Arts and Crafts, 1908.

Professional: Engineer, Astra Aeronautical Co., Nieuport Co.; August Euler Co.; Breguet Airplane Co.; Deperdussin Airplane Co.

Aeronautical Activities: Engineer and Mgr., Canadian Aircraft Works, Montreal, 1914; Huntington Aircraft Co., 1915; Mgr. metal shop and chief motor tester, Aeromarine Co., 1916; motor tester, Wright-Martin Co., 1917; Asst. Chief tool designer, Browning Machine Gun, Meriden, Conn., 1917; Aeronautical designer, McCook Field, 1918-1919; Pres. and Mgr., Air Transport Equipment, Inc., 1920 to date; Pres. and Mgr., Titan Trucking Corp., 1923 to date.

Member: Aeronautical Chamber of Commerce; N. A. A.

Present Occupation: Air Transport Equipment, Inc

Address: 563 Boulevard St., L. I. City, N. Y.; home, Glen Cove Avenue, Carle Place, N. Y.

Edward Laughlin

LAUGHLIN, EDWARD, Captain, Air Service; born, Sparta, Ind., Oct. 21, 1880; son of John W. Laughlin and Elizabeth (Whiteford) Laughlin; married, Elizabeth Foster, March 28, 1908.

Educated: Rossburg High School; Graduate Coast Artillery School, Engineering Course, Air Service.

Professional: In Army for the past 26 years; Private to Captain; Captain, Air Service, Nov. 24, 1917.

Aeronautical Activities: Chief Engineer Officer and Commanding Officer, Aviation Repair Depot, Speedway, Ind., 1918; Office, Chief of Air Service, and Chief Engineer Officer, Aviation Repair Depot, Dallas, Texas, 1919 to 1921; Chief Engineer Officer, San Antonio Air Intermediate Depot, 1922-1923; Aeronautical Engineering Course, McCook Field, 1924; Chief of Factory Section, McCock Field, 1924; Present duties, Chief Engineer Officer, Fairfield Air Intermediate Depot, Fairfield, Ohio.

Flying Rating: R. M. A., April 17, 1919; Airplane pilot.

War Service: With Coast Artillery, 1917; Personnel Officer, Balloon Section, Office Chief Air Service, Nov. 1917; Chief Engineer and Commanding Officer, Aviation Repair Depot, Indianapolis, Ind., 1918; On duty Office Chief of Air Service, and Engineer Officer, Aviation Repair Depot, Dallas, Texas till end of the war.

Present Occupation: Chief Engineer Officer, Fairfield Air Intermediate Depot, Fairfield, Ohio.

Address: F. A. I. D., Fairfield, Ohio.

Charles Edwin Lay

LAY, CHARLES EDWIN, Commercial Aviation; born, Quaker City, Ohio, August 28, 1876; son of John W. Lay and Margaret (Robinson) Lay; married, Bessie Day Taylor, Dec. 25, 1903.

Educated: Caldwell, Ohio, public schools.

Professional: Telegrapher; Construction Engineer; Promoter.

Aeronautical Activities: 1919 to 1922, Directed the operation of eight planes in Exhibition and passenger carrying; 1922 to present, development of Light Plane and research work on Air Transportation.

Flying Rating: Pilot (one arm.)

War Service: Supervisor of Telegraph during period of War.

Present Occupation: Commercial Aeronautical Engineering.

Address: Blue Ash, (Cincinnati), Ohio.

Harold M. McClelland

McCLELLAND, HAROLD M., Captain, Air Service; born, Iowa, 1893; son of John M. McClelland and Mary (Corbett) McClelland; married, Doris Cruger Mellersh, May 11, 1921.

Educated: Penn College, Iowa, 1912-1913; Kansas State Agricultural College, B. Sc., '16.

Professional: Appointed 2nd Lieut., Infantry, regular army, after leaving college.

Aeronautical Activities: S. M. A., Austin, Texas, March to April 1918; primary flying school, Rockwell Field, May 1918 Advancer Flying School, Rockwell Field, June to July 1918; instructor for Advanced Flying School, July to Sept. 1918.

Flying Rating: R. M. A., May 1918; A. P., August 1921

War Service: Army, Aug. 8, 1917 to date

Present Occupation: Captain, Air Service.

Address: Mitchel Field, L. I., N. Y.

Hamilton Keith Maxwell

MAXWELL, HAMILTON KEITH, Aerial Mapping & Photography; born, Sydney, Australia, May 17, 1886.

Professional: in business in Australia until 1913; had own studios in Sydney from 1916 to 1913; own studio in London, Eng., in 1913-1914; joined Royal Flying Corps as Photographic Officer. 1914.

Aeronautical Activities: Gazetted to R. F. C., May 1915; went overseas same month; served until Mar. 1919; U.S.A., Sept. 1919; flown 2800 hours.

Flying Rating: Gazetted out of R. A. F. with rank of permanent Major.

Honors: 4 times mentioned in Dispatches; 1915, Mons Star.

Member: Junior Naval & Military Club, London; Westchester Beltmore C. Club.

Present Occupation: Hamilton Maxwell, Inc.

Address: 15 West 45 St., New York City; home, Rye, N. Y.

Charles Townsend Ludington

LUDINGTON, CHARLES TOWNSEND, Commercial Aviation; born, New York City, Jan. 16, 1896; son of Charles Henry Ludington and Ethel (Saltus) Ludington; married, Constance Guyot Cameron, June 27, 1922.

Educated: The Haverford School; Yale, 1919, A. B.; M. I. T., two years

Professional: President B .B. T. Corp. of America, 1923 to date; Lighting Equipment, (Beacons, lenses, aerodrome floodlights).

Aeronautical Activities: Curtiss Exhibition Co., Miami, Fla., 1918; Naval Aviation (U. S. N. R. F. 5); 1918-1919 at M. I. T.; Packard Motor Co.; Naval Air Station San Diego, Cal. (Supervisor Aviation Quartermaster's Division, Mechanic's School); Ludington Exhibition Co., 1922.

War Service: Navy, as above, Ensign U. S. N. R. F.

Member: 2nd V. P., Aero Club of Pa.; Sec'y.-Treas., Phila. Chapter N. A. A., Gov. for Pa., N.A.A., Member, Executive Committee, Merion Cricket Club; University Club; Racquet Club (Wash.)

Present Occupation: Pres., B. B. T. Corp. of America; Pres., Ludington Exhibition Co.

Address: 820 Atlantic Building, Philadelphia, Pa.; home, Mill Creek Road, Ardmore, Pa.

Alfred Victor Verville

VERVILLE, ALFRED VICTOR, Airplane manufacturer; born, Atlantic, Mich., Nov. 16, 1890; son of Victor Verville and Fabianna (Miron) Verville; married, Bertha M. Kamrath, July 9, 1917.

Educated: Public Schools; High School.

Professional: Ford Motor Car Co., 1912; Hudson Motor Car Co., 1913; Edison Illuminating Co., Detroit, 1914.

Aeronautical Activities: Curtiss Co., Hammondsport, 1914; Aeromarine Co., 1914; Thomas Aeroplane Co., 1915; General Aeroplane Co., Detroit, 1915 to 1917; Fisher Body Co., Airplane Division, 1917-1918; U. S. Air Service Engineering Division, 1918 to 1925; Buhl-Verville Airplane Co., 1925; Designed: General Aeroplane Co., 100 P. O. school flying Boat, 100 POX school pusher, 100 POX school tractor; U. S. A. S. Eng. Div., D-9, VCP-I, Ambulance, Messenger, PW-I, Pursuit, VC-P-Racer; Designed Winner, Pulitzer Race, 1920; R-3 Speed Plane; Designed winner, Pulitzer Race, 1924; Member, Lockhart Mission to France, 1918; Member, Brig. Gen. Mitchell's Mission to Europe, 1922; Technical Advisor, Congressional Select Committee of Inquiry into Operation of Air Services 1924.

War Service: Aeronautical Engineer, Air Service

Member: S. A. E.; Detroit Athletic Club; N. A. A.

Present Occupation: Vice-Pres. in charge of Engineering, Buhl-Verville.

Address: 2730 Scotten Ave., Detroit, Michigan.

Casper P. Mayer

MAYER, CASPER P., Mining Engineer; born, Allegheny Co., Aug. 2, 1857; son of Casper Mayer and Catherine (Decker) Mayer; married Philomena Schulte, Jan. 8, 1879.

Educated: Curry University, 1889-1890.

Professional: 1886 opened general store; continued this business for 28 years; retail lumber, 1892 to date; Brick Mfgr., 1902 to date; Aircraft, 1919 to date; member Alle. Co. Planning Commission; Boro. Council of Bridgeville, Postmaster, one term.

Aeronautical Activities: Entered Aircraft business 1919; opened flying field, operated aircraft, built amphibian plane.

Member: Aero Club, Pittsburgh.

Present Occupation: Lumber, Aircraft, Brick Mfr., and Real Estate.

Address: 509 Washington Ave., Bridgeville, Pa.; home, Washington Pike, Bridgeville, Pa.

Igor I. Sikorsky

SIKORSKY, IGOR I., Aeronautical Engineer; born, Kieff, Russia, May 25, 1889; son of Ivan Sikorsky and Temchouk-Tzherkass Sikorsky; married, Elizabeth Simeon, Jan. 27, 1924.

Educated: Kieff High School; Naval Academy Petrograd; Kieff Polytechnic Institute.

Aeronautical Activities: 1908, built heliocopter; 1910, built second heliocopter; 1910, built three experimental airplanes; 1911, received highest award, Moscow Aviation Exposition for sixth airplane; also received first prize, Military Competition in Petrograd; 1913, built two, four motored airplanes, received first and second prizes Russian Military competition; 1914, established Russian records for distance, duration, altitude and lifting capacity; established in 1913 and 1914 World records for duration with five, seven and eight passengers, and in 1914, for distnce with 15, passengers; built series of multi-motored planes, the last having gross weight of 17000 lbs.; 1914 to 1917, built 73 airplanes at Russo-Baltic Car Works, Petrograd, for Russian Army at price of $125,000 each; 1917, went to France and started to build aircraft for French Government; 1919 to date, developing in United States, different types of airplanes; 1914, completed two-engined, 16 passenger plane; President, Sikorsky Aero Engineering Corp.

Flying Rating: F.I.A. pilot's certificate.

Books Written: "Way of the Air."

Present Occupation: President, Sikorsky Aero Engineering Corporation.

Address: 250 W. 57th St., New York; home, Westbury, L. I.

Intercity Airplane Reliability Tour

At a meeting of the Board of Directors of the Detroit Aviation Society on July 24, final plans were made for the Intercity Airplane Reliability Tour. This tour, which was proposed by the Society of Automotive Engineers will start from the Detroit Sept. 28 and return there, Oct. 3. William A. Mara of the Detroit Board of Commerce, is the general chairman for the tour. The other officials are as follows: E. Leroy Peletier, publicity; Charles T. Bush, finance; Russell A. Shaw, rules; Rudolph W. Schroeder, field arrangements.

The tentative route of the tour is as follows: Detroit, Fort Wayne, Chicago, Iowa City, Omaha, St. Joseph, Kansas City, St. Louis, Indianapolis, Columbus, Cleveland, Detroit. The total length of this route is approximately 1740 mi. This means that an average run of 290 mi. per day will be flown. As the first and last days will probably be flown over short distances, the average distance for the other four days will be approximately 350 mi. The start and the finish will be at the Ford Airport.

The entries are limited to manufacturers of commercial airplanes. The Detroit Aviation Society has already received assurances that at least eight and possibly twelve manufacturers of commercial aircraft will enter machines. It is planned to hold an airplane exposition during the week of the tour.

At the same meeting, the Directors invited the National Aeronautic Association to hold its annual convention in Detroit, on Friday and Saturday, Oct. 2 and 3. These days will permit the delegates to witness the conclusion of the tour. The directors of the tour believe that the holding of the convention in Detroit at that time will encourage attendance, as delegates can then go to New York for the Pulitzer Races. The Directors also have received assurance that the Shenandoah will visit the Airport at that time. Harold H. Emmons is chairman of the committee on Convention Arrangements.

Italian Flight to Australia and Return

The finest long distance cross country flight so far undertaken this year is that of Commander Pinedo and Sergeant Campanelli of the Italian Air Force. These two men in a Savoia S16ter flying boat fitted with a Lorraine Dietrich 450 hp. W engine have mapped out a course from Italy to Australia and return via Japan a total distance of over 32,000 mi. or approximately 9,000 mi. further than the course of our Around the World fliers. Leaving Sesto Calende, on Lake Maggiore in Northern Italy on April 21 the fliers had reached Melbourne on the South East Coast of Australia by June 9 having covered the 15,000 mi. in 50 days or an average of 300 mi. per day. The reported flying time is 120 hr.

The Savoia flying boat has a maximum speed of 125 mi./hr. a cruising speed of 110 mi./hr. and a landing speed of 50 mi./hr. The total useful load carried is 1,980 lb. of which 1,450 lb. is fuel giving a range of 7.5 hr. The Lorraine Dietrich engine seems to have given remarkably satisfactory results. Several long overland flights have been made notably from Lake Maggiore to the sea and from the Mediterranean to the Persian Gulf. The log of the flight follows.

Apr.	21:	Sesto C.-Pisa-Brindisi	Mi.	652
	23:	Brindisi-Leros	"	621
	24:	Leros-Alessandretta	"	559
	25:	Alessandretta-Bagdad	"	559
	26:	Bagdad-Bushire	"	528
	27:	Bushire-Bender-Abbas	"	446
	29:	Bendar Abbas-Chaarbar	"	341
May	4:	Chaarbar-Karachi	"	403
	10:	Karachi-Bombay	"	652
	11:	Bombay-Kokanada	"	685
	12:	Kokanada-Calcutta	"	652
	13:	Calcutta-Akyab	"	310
	14:	Akyab-Rangoon	"	372
	18:	Rangoon-Tavoy	"	248
	19:	Tavoy-Mergui	"	124
	21:	Mergui-Puket	"	310
	22:	Puket-Penang	"	217
	23:	Penang-Singapore	"	403
	25:	Singapore-Batavia	"	590
	27:	Batavia-Surabaya	"	465
	28:	Surabaya-Bima	"	434
	29:	Bima-Kupang	"	434
	31:	Kupang-Broome	"	614
June	1:	Broome-Port Hedland	"	294
	2:	Port Hedland-Carnarvon	"	497
	3:	Carnarvon-Perth	"	528
	4:	Perth-Port Albany	"	372
	6:	Port Albany-Israelite Bay	"	390
	7:	Israelite Bay-Eyre	"	559
	8:	Port Eyre-Adelaide	"	465
	9:	Adelaide-Melbourne	"	559
		Total	Mi.	14,266

Commander de Pinedo

Detroit-Chicago Costs

On June 13 the Ford Airways completed their one hundredth trip without accident. All but twelve of these trips were made with one ship, as the management of the airline were desirous of obtaining accurate figures on the type of ship used as soon as possible. Had this line been carrying passengers instead of freight, the performance would have been 270.000 passenger-miles. The average time, both ways, each day, has been close to two hours and thirty-five minutes. This means a cruising speed of over 100 mi./hr. with the engine turning over around 1500 r.p.m. The project of having this one plane make two return trips per day is under consideration by the management.

It has been stated in the press that the cost of operating this service has been eight and a half cents per pound. It can be definitely stated that this figure is incorrect, in that it does not include many essential items of cost such as terminal charges, engine maintenance etc. A more accurate figure may be given as $0.134 per pound. This figure includes the requisite items of cost. It is based on a load of 1,000 lb. Actually the planes are carrying a mechanic and his tools adding about 200 lb. and 30 gal. of additional gas which would bring the pay load up to about 1,500 lb. if they made an intermediate stop and dispensed with the mechanic, as does the air mail service.

The Maiden Dearborn II made nine round trips in May during which she covered 4,590 mi. and carried 18,077 lb. of freight. The express rate from Detroit to Chicago is $2.05 per hundred pounds and the freight rate $0.67 per hundred pounds. The airplane takes six hours, any other medium takes at least two days. The cost for this particular ship works out as $0.1223 per pound. This cost was arrived at from the following items: Plane depreciation, $333.33; engine depreciation, $315.58; insurance, $116.66; labor, $733.02; gasoline, oil and repair parts, $405.88; miscellaneous, $48.29; total, $1,952.76.

AIRPORTS AND AIRWAYS

Pittsburgh, Pa.

By Ray A. Tucker

It is gratifying to see the strides flying has taken in this locality and especially at Rodgers Field, the Pittsburgh Airdrome since its opening in June. The three Government "Jennies" which arrived recently at the Airdrome for use of Reserve Officers have been constantly kept on the job. Their first official flight over Pittsburgh was as a formation to stimulate interest in the American Legion Endowment Fund. They were flown under command of Lieut. Royal B. Lea, officer in charge of Rodgers Field and by the following members of the Aero Club holding Reserve Commisions: Capt. Ewing W. Day, Jr., 1st Lieut. Howard B. Pearce, 1st Lieut. John P. Morris and 2nd Lieut. Robert C. Wentz.

Alterations have already been started on the Club House of the Aero Club and construction of an administration building is also under way at Rodgers Field.

William H. Emery, Jr., of Bradford, Pa., a member of the Aero Club just recently purchased a new Travel Air ship and is delighted with its performance. Emery maintains his own field and hangar in Bradford, and recently had the pleasure of entertaining Captain Nungesser, the French Ace, who landed on his field due to a forced landing while en route from Buffalo to Jamestown, N. Y.

Other members of the Aero Club who are maintaining their own ships for commercial and pleasure purposes in and around Pittsburgh are John P. Morris, Louis C. Faurot, Earl T. Moores, Merle A. Moltrup and Alton N. Parker and are all doing a good business. Myron Powers just recently sold his Jennie to William Beatty.

Garden City, N. Y.

By Warren J. White

Mr. and Mrs. William Fox and a number of Fox Film Co. officials attended the christening of their new C6A Curtiss Oriole which the news division of their company has purchased to transport news reels about the country. As a crowd of onlookers sadly gasped Mrs. Fox broke a bottle of champagne over the nose of the plane and immediately after Pilot Wies took off, gracefully circled the field and landed before a battery of Fox Newsreel cameramen. The rest of the afternoon was devoted to carrying the officials who were well pleased with the pilot and the ship. Prohibition agents beware. T'was only cider.

Pilot W. H. McMullen delivered last Monday the Curtiss Exhibition Co.'s big blue D12DH from their Garden City Field to their Field at Buffalo. A Fairchild camera-man was along and made a number of obliques. The plane will be used there to test new engine developments.

The Ku Klux Klavalkade which is being held at a large field on the Long Beach Road has chartered two of the Curtiss Exhibition Co.'s four passenger C6 Standards to carry members of the Klan. At this monster Karnival and jubilee which will be held on four days of the week of July 19 and four days starting July 29, it is expected there will be an attendance of over forty thousand Klan members. It will be interesting to note the number of passengers carried during this gigantic gathering.

The Ireland Comet, a new and interesting ship built around the OX5 engine, was tested by G. S. Ireland last Saturday morning at Curtiss Field. Immediately after the test flight Mr. Ireland flew to the Aero Club of Pennsylvania flying meet at Pitcairn Field, Bryn Athyn, Pa. With full load of two passengers and 45 gal. of gasoline and bucking a strong wind he made Bryn Athyn in 1 hr. 30 min. cruising at 1300. The Bryn Athyn Field is located about 20 mi. north east of Philadelphia. All in all the ships performance is very promising, and full performance data and specifications are promised in a forthcoming issue.

Pilot Andrews flying a special Curtiss C6 four passenger Standard brought home to Curtiss Flying Field at Garden City a nice new shiny silver cup as a reward for winning the landing to a mark contest at the Aero Club of Pennsylvania meet at Pitcairn Flying Field in Bryn Athyn, Pa.

Saddened and disheartened Casey Jones returned from Cleveland after an unsuccessful attempt to sell Cy Caldwell a metal propeller for the new Glenn Martin Commercial plane. Caldwell denies that he is Scotch but Casey says that from his dealings with him and his observations of him, that if his ancestors didn't come from Scotch-land they certainly must have come from Jerusalem or Rye.

Last Sunday N. T. Grandlund better known as NTG the silver tongued announcer of radio station WHN, took Mary Mulhern of the Follies for an airplane ride over Long Beach. While over Long Beach NTG did a little fancy wing walking, and nearly scared Pilot McMullen and little Mary to death. During the flight they dropped advertising matter for a big party at the Pavilion Royal which was given last Sunday night. Mary says there's more going up in the Follies than one thinks.

The Balsams-Garden City Aero Corp. made the initial flight of its third successful season last Saturday, from Curtiss Flying Field at Garden City to Dixville Notch, N. H., a distance in airline of 370 mi. The first run was made in exactly 4 hr. actual flying time, by Pilot Arthur Heinrich. The other pilots on the run are Lieut. George Pond, a well known test pilot of the Navy, and Kenneth Unger, former pilot with many years experience on the Western Division of the U. S. Air Mail. This is the longest known non-stop run in the world operating on a regular schedule and exclusively carrying passengers and newspapers. The Balsams-Garden City Aero Co. is under contract by the J. J. Lannin Co., proprietors of The Balsams Hotel at Dixville Notch, N. H., and the Garden City Hotel at Garden City, L. I., to maintain this route as a convenience to the guests of both hotels. It is possible for guests to have a New York morning newspaper at the breakfast table. By rail newspapers would not reach the Balsams until late in the afternoon of the following day.

Cleveland News

By Cy Caldwell

Over a year ago Cleveland Chapter N.A.A. began a campaign for a Municipal Airport; and it is pleasing to know the Chapter has realized such prompt action, due to efforts of City Manager W. R. Hopkins and the City Council. Not since the days of Mayor Tom L. Johnson has Cleveland had such a man as Hopkins; and it is largely owing to his foresight and ability that the Airport has become a reality. Mr. Hopkins' efforts in this and other lines will do much to make Cleveland one of the most progressive cities in the country.

The City Council has authorized a bond issue of $1,250,000.00 to purchase the 1,000 acres already leased, and has also authorized $70,000.00 immediately for draining the field, and instructed Park Director Harmon to provide comfort stations for the public, who take a keen interest in the Airport and visit the field by hundreds every day.

East and West runway 3000 by 500 ft. is graded and rolled, and a North and South runway of like dimensions will be completed by Aug. 1. Eventually the whole 1,000 acres will be a flying field.

The Air Mail operates two planes each way to New York and Chicago for their day and night service, while the Ford Motor Co. operates a ship to and from Detroit every day. Several Army and Navy planes have visited the Field recently, as have various commercial planes—a commercial plane being any collection of wood, wire and cloth dragged around by an OX5.

The purchase of this Airport by the City for one million and a quarter dollars is very painful to me personally, for it shows what a splendid opportunity I missed. Five years ago I could have bought this 1000 acres for next to nothing—a mere $400,000.00. How I could have overlooked such an opportunity I do not know. But I didn't buy it. I let someone else snap up the property for a song—a measley $400,000.00. Contemplation of my lost opportunities is very painful to me.

Paul Collins flew an Air Mail DH to Akron to take part in Akron's Centennial Celebration July 19. Collins says he thought Akron was older than that—he couldn't imagine how it had got so dirty in only a hundred years.

"You are cordially invited to attend an Air Meet at Stow Field," read the invitation of Akron Chapter, N.A.A. sent to me. I went, and was charged $.50 to get in. I am cordially inviting some friends to dine with me tonight—and will soak them $.50 cover charge. I am quick to appreciate good ideas.

The Glenn L. Martin Co. has completed the first 35 of 75 SC1 type 3-purpose planes for the U. S. Navy.

Dean Smith, one of the oldest pilots in the Air Mail, took off from Bellefonte the other day without his gas-stretcher, a device invented by J. E. Whitbeck, Eastern Division Superintendent, Air Mail. Smith found his gas was running low near Solon, Ohio, and reached down for the Whitbeck Stretcher. The good old stretcher wasn't in its nook. Smith, knowing he could not stretch his gas to reach Cleveland without this useful device, gripped the control stick with his knees and helped the DH along by fanning the air backwards with his hands, as a swimmer does in water. It was a gallant effort, but unavailing. The unstretched gas gave out, and paddle as he might, Smith could not keep the DH up. He landed it, gasless, at Solon, 12 mi. east of here. Art Smith flew from Cleveland and picked up the mail, which got to Chicago on time. But it taught a valuable lesson—never go up without your gas-stretcher. In fact, this device is so genuinely appreciated that pilots in their prayers each night say: "God bless papa and mama, and Mr. Whitbeck and his gas-stretcher."

Boston, Mass.

By Porter Adams

Col. Harold E. Hartney was a visitor to Boston last week when he came over in the interests of the Sikorsky Co. Colonel Hartney was accompanied by Captain Colyer, pilot of the company and together they inspected the Boston Airport and conferred with various local people active in aviation. It was the first time the Colonel had been to Boston and we hope that it was only the beginning of a series of similar visits.

The day after we had mailed our last notes in which we expressed the regret of the residents of the Connecticut Valley that the New York-Dixville Notch airplane service was not operating this summer, we noted the welcome sight of a plane flying high up the valley, and since that day they have been operating regularly so we presume that the service has started for this year and while they may not hear us, we cheer them from the farm at Thetford, Vt., daily as they pass by.

Word has been received in Boston that Capt. Louis R. Knight, air officer of the First Corps Area, is soon to be detached and that he is to be succeeded by Major Ira Longanecker.

Dan Rochford, the able aviation editor of the *Boston Transcript* who conducts the best aviation column in New England each Monday under the title of "The Week at the Boston Airport" has been for the last two weeks with the National Guard at Camp Devens and for this reason the column was one day late this week, but it arrived this morning and we note that the Army fliers at the Boston Airport had a total flying time of 28 hr. 5 min. last week. The Mass. National Guard made a total of thirteen flights with a total time of 12 hr., while the Naval Reserve Air Station at Squantum flew 78 hr. 8 min. of which Lieutenant Thomas, executive officer of the Station made 25 hr. 2 min.

Speaking of aviation columns, Cy Caldwell wins the midsumer prize with his description of the opening of Cleveland Municipal Airport in the July 20 issue of AVIATION. In fact, Cy is entitled to a perpetual prize and if the publisher would have a separate volume of Cy's correspondence printed and give it free with a five year subscription, the future of AVIATION, at least, as far as we are concerned would be assured for the next five years.

Battle Creek, Mich.

In the last few years events have been moving with amazing rapidity. The Chinese have taken up flying and are developing excellent pilots; the world has been circumscribed by aircraft; Amundsen has been flying around looking for an elusive North Pole; a national airway system has been inaugurated in the United States, and Mitchell has lost his job. Battle Creek (there is only one Battle Creek) has also contributed to the melee.

Clayton Brukner, E. J. Junkin and E. A. Goff, Jr., in 1914 built aircraft after their own designs with funds contributed by local sportmen and school teachers. Brukner and Junkin are now with the Advance Aircraft Co. in Troy, Ohio, building the Waco. E. A. Goff, Jr., after serving as a pilot in the World War has been connected with the Battle Creek Air Service Co., the Michigan Aero Service Corp. at Lansing, Mich., and is now president of the Michigan Commercial Aviators Association.

During 1919 a movement was started in Battle Creek to establish a municipal airport. The Battle Creek Aero Club was organized with a charter membership of seventy-five, including fifty prominent business men. This club continued in operation until 1924 when a chapter of the National Aeronautical Association was formed. A night school was conducted for students in theory and members were given flying instruction for the price of gas and oil. Eight pilots were enrolled for this work.

The club used its influence on the officials of the Chamber of Commerce through their progressive secretary, John I. Gibson, and in 1920 a definite program was inaugurated for securing a field. Public sentiment was not strong enough in favor of the venture to make possible its immediate success.

An aviation committee of the Chamber of Commerce was organized, consisting of Stephen J. Rathbun, chairman; Fred Zinn, Luton S. Knowles, B. H. Welch, Vernor W. Main and E. A. Goff, Jr. An extensive survey was made of the territory surrounding Battle Creek and a report was made regarding available fields.

A field was finally secured under a five year lease with option of purchase and Battle Creek Airport was established Oct. 6, 1924. The field is located three miles west of the center of the city at the end of a paved road. It consists of 138 acres of smooth, level ground. The surrounding terrain is exceptionally well adapted for safe flying.

Fordson tractors were loaned to the aviation committee by the American Legion Hospital, the Kellogg Co., the Dudley Motor Sales and Cushman Auto Sales Co. The city commissioners voted $300.00 to be used in preliminary conditioning of the field and the Chamber of Commerce donated $300.00 more. B. H. Welch, Howard S. McOmber, Luton S. Knowles and E. A. Goff, Jr., each contributing a week of their time, plowed, disc harrowed and floated the field. The field has been sowed to blue grass. Quite a number of local merchants and garagemen donated material and labor toward the erection of a gate and two wind pennants. A local gasoline jobber has donated and installed gratis, a gas and oil dispensing outfit.

An air race meet is being planned for Aug. 28, 29 and 30. A subsidiary corporation has been formed by the Battle Creek Chamber of Commerce for the purpose of handling the finance for the meet. The organization is known as the Battle Creek Air Transportation Association with Charles C. Green, mayor of Battle Creek, president; John I. Gibson, secretary of the Chamber of Commerce, vice-president; Edwin R. Morton, vice-president and cashier of the City National Bank, secretary and treasurer; E. A. Goff, Jr., Luton S. Knowles, business managers. The three officers and George J. Genebach, president of the United Steel and Wire Co., Robert R. Thompson, general superintendent of Postum Cereal Co.; Stephen J. Rathbun, of Rathbun and Krafe; and Fred Zinn, of A. K. Zinn and Co., form the Board of Directors.

The program is comprised of eight contests and fourteen other events. The plans for the meet are going ahead rapidly and to all indications the Battle Creek meet will be one of the outstanding events of the 1925 season.

UNITED STATES AIR FORCES

New Uniform

Hon. Dwight F. Davis, Acting Secretary of War, has definitely approved the new uniform for officers of the Air Service. The following is a general description of the altered articles of uniform as adopted:

The officer's coat will be a single-breasted four-button coat made of the same material as the present one with a roll collar and notched lapel. It will have four pockets with flap on each. It will be cut to extend two or three inches below the crotch and to fit the figure easily over the chest and snug at the waist. It will have a belt two inches wide sewed down, all round the waist. All insignia will be embroidered in gold and silver bullion.

The overcoat will be a double-breasted four-button overcoat with roll collar and notched lapels. Three buttons will show below the end of lapel roll. The coat will reach one inch below the knee. The insignia of rank will be on shoulder loops.

The cap will be similar in type to the overseas cap and will have a piping of ultra-marine blue with golden orange threads.

The boots will be similar to the present field boots, but need not necessarily be weatherproof, nor with bellows tongue.

The olive drab shirt will be of the existing type, except that shoulder loops need not be worn when the coat is worn.

Stockings will be "golf commercial," plain tops and made of olive drab wool.

It is expected that formal orders announcing these changes in uniform will be issued to the Service within a short time.

Parachute Again Saves Life

Lieutenant Limberg, Air Service Reserve, is the twentieth flier whose life was saved through the medium of the Army parachute. The incident occurred recently at the Lambert-St. Louis Flying Field, and it demonstrated the wisdom of enforcing all rules and regulations pertaining to the factor of safety.

The 35th Division Air Service is stationed at this field with Maj. W. H. Leininger in command. By authority of Gen. Wm. M. Raupp, the commanding officer of the 35th Division, assumed charge over the factor of safety and flying operations on the field—a mutual arrangement which has worked to advantage in handling the many civilian ships and the care of the public. A test flight was to be made in a new ship designed and constructed by Sergeant Bell of the Air Unit. To all appearances the plane was stable and with every indication of flying propensities.

Lieutenant Limberg, who recently returned from Kelly Field, undertook to make the test flight. Before taking off the Officer of the Day in charge of the field insisted that the pilot wear a parachute. To make a long story short, the airplane slipped into a left hand spin at 2,000 ft. after eight or ten minutes of perfect behavior. The pilot made every effort to right the plane, but without success, and finally at 300 ft. he jumped out of the plane. The parachute opened at once and a fairly safe landing was made, Lieutenant Limberg sustaining a bruised shoulder.

The 110th Photo Section of the 35th Divison, observing the flight, took phtographs at the instant of the jump, showing the nose dive and exact position of the plane. This photograph is on record at the above station.

Aviation Medicine Class

The School of Aviation Medicine at Mineola, L. I., N. Y., held a special session for Reserve and National Guard Officers for the period May 1 to June 15 last. The following officers took the preliminary course and have been qualified to perform the physical examination for flying:

Majors William D. Petit, Thorndale, Tex.; Irwin E. Ruhl, Kansas City, Mo.; Lewis W. Fetzer, Dallas, Tex.; Alexander W. Burke, Chicago, Ill.; Archie McCallister, Oteen, N. C.; Victor W. Maxwell, Sanitorium, Miss.; Capt. Albert J. Pullen, Fond-du-Lac, Wis., all of the Medical Reserve Corps; Capts. Louis C. Pawelek, Houston, Tex.; and Wilbur F. Smith, Indianapolis, Ind., of the National Guard.

The following officers took the advanced course and qualified as flight surgeons: Lieut. Col. Serge Androp, Gallipolis, Ohio; Major Haramont N. Anderson, Woodbine, Iowa; Major Granbow Thomsen-von Colditz, Evanston, Ill.; 1st Lieut. Albert J. Herbolsheimer, Minneapolis, Minn., all of the Medical Reserve Corps; and Capt. Elmer E. Langley, Spokane, Wash., of the National Guard.

Major Charles W. Greene, Sanitary Reserve Corps, Columbia, Mo., reported for two weeks' training in the progress of physiology of aviation.

This class, which comprised officers from every section of the country, is the largest Reserve and National Guard class which has ever passed through the School.

The course of instruction was entirely professional and consisted of lectures, practical work at the School and clinics in New York City. The subjects taken up in the preliminary course were ophthalmology and otology, cardiology, and neuropsychiatry. In the advanced course the same subjects were taken up plus physiology, psychology and administration.

On June 11 the class gave a dinner at Mineola for the faculty. Besides the faculty and class there were present Lieut. Col. Wm. R. Davis, Medical Corps, Chief of the Medical Section, Air Service; and Major H. P. Carter of the School Section, Surgeon General's Office. At the dinner the class gave their impressions of the School and the faculty spoke on the course from the standpoint of the instructor. Colonel Davis and Major Carter emphasized the importance of the work and the necessity of training a large number of Reserve and National Guard Officers for duty with the Air Service.

Kauai Flight

Six Martin Bombers from Luke Field, H. T., were recently sent on the first concerted flight to the distant Island of Kauai at the westernmost end of the Hawaiian Group. Prior to this flight several planes had made the trip singly to Kauai, and several suitable landing fields were established on that island. One of the bombers sustained damage to an aileron, which resulted in keeping the pilots and crew on Kauai for five days. The remainder of the mission remained on Kauai over night and returned to their home station the next day without mishap. The Navy had dispatched a tender to patrol the center of the channel during the long 100 mi. water flight.

Army Air Orders

Capt. W. O. Butler from Langley Field, Va., to Brooks Field, San Antonio, Tex., not later than Sept. 13, 1925, to the Air Service Primary Flying School for course of instruction.

Major Gerald C. Brant, leave of absence eleven days from July 21.

Sec. Lieut. Paul Ready Greenhalgh transferred to Cavalry.

First Lieut. H. S. Kenyon from Clover Field to survey officer at Douglas Co.

First Lieut. Oliver W. Broberg from Selfridge Field to Chanute Field.

First Lieut. James E. Duke from Kelly Field to San Antonio Air Intermediary Depot.

First Lieut. Walter T. Meyer from Fort Bragg to Kelly Field.

Sec. Lieut. Hilton W. Long from Kelly Field to Selfridge Field.

First Lieut. Rex K. Stoner from Langley Field to Brooks Field.

First Lieut. Harold L. George from Phillips Field to Chief of Air Service, Washington, D. C.

First Lieut. Frederic B. Weiners to Kelly Field amended from San Antonio A.I.D.

Sec. Lieut. Rodney Stuart Lamont, O.R.C., orders amended to read July 22.

Capt. James L. Hatcher, twenty-six days leave of absence, effective Aug. 12, 1925.

Sec. Lieut. Howard H. Couch, Sec. Lieut. William O. Eareckson, Sec. Lieut. Edward H. White, to Balloon and Airship School, July 15 instead of Sept. 15.

Sec. Lieut. Leslie A. Skinner, Sec. Lieut. Gordon T. Waite, Sec. Lieut. Leslie F. Young, Sec. Lieut. Uzal G. Ent, to Air Service Balloon and Airship School for instruction.

First. Lieut. Henry G. Woodward, from Primary Flying School, Brooks Field, to Advanced Flying School, Kelly Field for training.

U. S. NAVAL AVIATION

Flight Orders

The following instructions will govern the issuance of flight orders in the Navy during the fiscal year 1926:

(a) Flight orders will be allowed for:

All men holding certificates of qualification as Naval aviation pilot, seaplane, ship-plane or heavier-than-air, who are detailed to duty involving actual flying.

(b) Radio operators at Air Stations, or in plane squadrons to which are assigned planes equipped with radio apparatus and in active operation, as follows:

(1) One flight order for each plane that habitually carries a radio operator while in flight.

(2) One flight order for each five planes that do not habitually carry a radio operator while in flight.

(c)) Photographers, as follows:

(1) One flight order for each air station, and one for each fully organized scouting plane squadron, observation plane squadron and torpedo and bombing plane squadron.

(d) Aerographers, as follows:

(1) One flight order for each of the Staffs of Commanders, Air Squadrons, Scouting Fleet and Air Squadrons, Battle Fleet.

(e) Mechanics in the operating crews of planes actually assigned to an aircraft squadron or air station and in active operation as follows:

(1) One flight order for each single-engined seaplane or airplane plus one additional flight order for each four planes.

(2) Two flight orders for each twin-engined plane plus one additional flight order for each three planes.

(3) Five flight orders for each plane equipped with more than two engines.

(4) In no case under (e) will flight orders be allowed for any plane assigned to any command in excess of the "operating complement" of planes as found in the "Aeronautical Organization 1926."

(f) Operating crews of airships in active operation as follows:

(1) Four flight orders for J1.

(2) Twenty-five flight orders for each rigid airship.

2. The term "in active operation" shall be interpreted to mean that the aircraft is actually in operation for the period covered by flight orders, except that it may be on an inactive status for minor repairs for not exceeding one month.

3. Flight orders for lighter-than-air or balloon pilots may be issued only within the allowance given under paragraph 1, subparagraphs (e) and (f).

4. Flight orders may be issued to men of any pay grade provided that the total of those in the first pay grade at each station or in each fleet, shall not exceed fifty-six per cent of the total allowance of such station or fleet as outlined above.

5. Requests for flight orders necessary for special projects and for men under instruction in flying as a part of a course approved by the Bureau of Navigation will be forwarded to the Bureau for action, together with full information in each case.

Ad. W. R. SHOEMAKER, U.S.N.
Chief Bu. Nav.

Transfers to Aviation Branch

Requests continue to be received in the Bureau of Navigation for transfer of petty officers of general service ratings to corresponding ratings in the aviation branch. The following is quoted from a letter to the Commanders-in-Chief, under date of Feb. 9, 1925: "No rated men of general service ratings have been placed on the Bureau's eligibility lists for change of rating to the aviation branch since June 13, 1924, nor is it intended to approve any such transfer in the future."

The Bureau uses as a guide the general policy that men shall not be transferred from one branch to another when such transfer will deny advancement to men of the lower ratings who are being trained for advancement in their own respective branches.

Seaplane for President

A Navy seaplane will furnish aerial despatch service to President Coolidge while he is at Swampscott, Mass., this summer. The plane, a twin-engined seaplane, type F5L from the Naval Air Station, Hampton Roads, Va., will leave that Station to fly to Marblehead, Mass., where the officer in charge of the plane, Lt. W. K. Patterson, U.S.N., will report to the Captain of the Presidential yacht *Mayflower*. Lieutenant Patterson and a crew of five men are all from the Naval Air Station, Hampton Roads.

This plane is suitable for carrying despatches and newspapers, and might even be used as an ambulance. Possessing very rugged qualities, as shown by the performance of this type with Fleet maneuvers at sea during the past six years, the F5L can be depended upon to carry out any duty assigned with the greatest reliability and despatch.

This service is in line with the policy of rendering every assistance possible by Navy planes to the President while away from Washington. On numerous occasions in the past, while the President has been cruising in Chesapeake Bay on the *Mayflower* Navy planes have delivered newspapers to him.

Hawaii Flight

Seven destroyers have been ordered to prepare to sail from Puget Sound, San Diego and Hawaii to form patrols for the three Naval seaplanes which will attempt the Pacific Flight Sept. 2, flying from California to Honolulu. The McCawley, and Wm. Jones will go to sea about Aug. 17 from Puget Sound; the Meyer, Doyen and Corry will sail from San Diego Aug. 20, and the Reno and Faragut will leave Hawaii on Aug. 20 for their positions at Sea. They will patrol the long sea lane from California to Hawaii, handling radiograms and orders for the three seaplanes and clearing radiograms giving weather reports for the fliers. In the event of any plane having to alight on the sea they will render aid and rescue the fliers if necessary.

The plane carrier Langley and the aircraft tender Aroostook now at Hawaii will also put to sea on Aug. 20, in connection with the Hawaiian flight, in compliance with orders from Admiral S. S. Robinson, Commander in Chief, Battle Fleet.

Navy Air Orders

Lt. George D. Price, Bureau of Aeronautics to Naval War College.

Lt. (j.g.) Horace L. de Rivera, U.S.S. R17 to temp. duty N.A.S., Pensacola.

Lt. (j.g.) Blair M. Fuller, U.S.S. Whipple to temp. duty N.A.S., Pensacola.

Lt. (j.g.) George C. Miller, U.S.S., Cincinnati to temp. duty N.A.S., Pensacola.

Ens. William A. Graham, U.S.S., John D. Edwards to temp. duty N.A.S. Pensacola.

Ens. Lawrence E. Hurd, U.S.A. Henderson to temp. duty N.A.S., Pensacola.

Lt. Comdr. Grady B. Whitehead, orders 704-25 modified to Aircraft Squadrons Asiatic Fleet.

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PUBLISHER'S NEWS LETTER

The anti-aircraft propaganda of the Coast Artillery is beginning to show results from the summer practise shoots, with the Air Service towing "sleeves" for targets. Impressive figures will show how much greater accuracy can be obtained now than during the war. Great stress will be laid on the improvements made in anti-aircraft artillery and the greater possibilities of bringing down aircraft. But aviation people will not be deceived. They know that the targets slow up the speed of aircraft about 33 1/3 per cent, so that an airplane with a normal speed of about 100 mi./hr. will only make a seventy mile speed when dragging a target through the air. They also know that the planes are flown in a prescribed course and at a given height. The targets are not maneuvered but are flown right into the field of fire. Then, too, there is the uncertain zone of "constructive" hits that confuses the results. It has been a gay summer for the Air Service officers who have been towing targets! It will be more interesting when the Air Service is allowed to use coast defense forts for practise shoots.

* * * *

A congressman who heard that one of these anti-aircraft target practise shoots was to be held, decided to fly to the fort and see what could be accomplished. It happened to be foggy, and on landing at the Coast Artillery post, the inquisitive Congressman made inquiry of the Commanding Officer as to when the anti-aircraft exhibition would take place. He was informed that owing to the fog, the targets could not be seen. "But we could have blown you up with aircraft bombs," was the tart reply of the Congressman. Which all goes to prove that even a congressman uses greater powers of penetration than Army officers usually credit them with having.

* * * *

There has been so much said recently about the peculiar laws of Tennessee that we have hesitated to add to the overwhelming opprobrium that has resulted from the Dayton trial. It may also be mentioned that we have not recently referred to the other Dayton of which we have had much to say in the past. We can sympathize too deeply with those residents of the "Center of American Aviation" when they travel and have to explain that they are not from the town of publicity lovers and evolution trials. But Tennessee should be made famous for its aviation laws as well as its Evolution Law. They show that the state intends to keep "those new fangled flying contraptions" from darkening their skies. The only kind of flying they seem to crave is a "chariot of fire" such as Elijah took off in when he ascended from the banks of the River Jordan after he had divided the waters and crossed on dry land.

A flier from a neighboring state decided to visit Tennessee and do a little passenger carrying. When he landed at Lawrenceburg he was given a warrant for his arrest by the Sheriff and told that he would have to pay a State tax and also a tax in every county that he visited. The pilot, Roscoe Turner, figured roughly that in order to fly wherever he chose in Tennessee, legally, he would be subject to a tax of $4,750 a year. He wrote to AVIATION asking that we make an investigation, which proved to be very illuminating. Mr. Turner wrote: "according to information from the county court clerk at Lawrenceburg, it will cost an aviator with one plane, $4,750 per year to operate in every county of the state of Tennessee. Since an airplane can hardly operate in one county alone, it makes it impossible for an aviator to take a plane to Tennessee. If the people of that state are to learn about flying and advance with aviation, this law will have to have some alterations."

He also enclosed a receipt for the operation of an airplane for hire for three months with the items distributed as follows: State Tax, $6.25; County Tax, $3.12½; School Tax, $1.56¼; Road Tax, $1.56¼; County Court Clerks' Fee, $1.00; Circuit Court Clerk's Fee, $.50; Total Tax, $14.00. This covered the three months period from May 9 to Aug. 9, 1925.

* * * *

A letter from the Hon. Ernest N. Haston, Secretary of State of Tennessee dated, May 23, 1925, stated that "Tennessee has no state law regulating aviation or aircraft." Further inquiry brought the revenue bill for 1925 which carries a tax of $25 for "aeroplanes, airships or other machines propelled through the air, where a charge is made for carrying passengers or freight by such methods, each, per annum." But this did not clear up the double tax so another request for information brought a letter from the State Comptroller that will be of interest as an example of what comes from state regulation of flying.

Mr. Graham writes: "The tax levies in the 1925 Revenue Bill is a state tax, *and each county, through the county court, adopts this Revenue Bill as its own. Therefore, the state and county privileges would be double the amount as set out in the Revenue Bill.* The reason the privilege tax is levied against aeroplanes is that we have had, from time to time, parties bringing their planes here and taking people up and charging $10 or $15 for a ride." From this it will be seen that each of the 95 counties not only may exact the State Tax, but an equal amount for its own treasury with petty fees included. If pilots who are experiencing similar double taxes, or find other looseness in tax methods, will send AVIATION the facts, we will make an investigation and spread the information among the flying fraternity.

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(Continued on page 134)

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(Continued)

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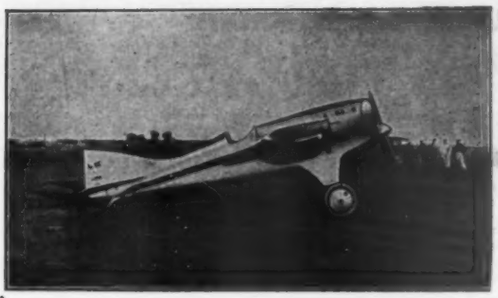

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We have 333 airplanes that we must sell this year including Standards, Jennies, Canucks, Orioles, D.H.'s, Spads, T.M. Scouts and others. We have a large number of Standards, Jennies and Canucks set up, test flown ready for immediate fly away delivery. Come and take your pick.

NEW STANDARD J-1 AIRPLANES with guaranteed overhauled Hispano-Suiza motors, 150 H.P.	$1500.00
NEW STANDARD J-1 AIRPLANES with new OXX6 motors	1300.00
NEW STANDARD J-1 AIRPLANES with Government overhauled OXX6 motors	1100.00
NEW STANDARD J-1 AIRPLANES with new OX5 motors	1000.00
NEW STANDARD J-1 AIRPLANES with Government overhauled OX5 motors	900.00
NEW STANDARD J-1 AIRPLANES without motor	750.00

These airplanes come complete with tools and instruments and the front seat is built so as to accommodate two passengers. These airplanes have been reconstructed and new longerons, new controls, new wires, new struts, new fittings, new instruments were installed where needed.

LEARN TO FLY

NO BOND REQUIRED FOR SOLO FLIGHTS AND NO CHARGE FOR BREAKAGE

$100.00

ROOM AND BOARD NEAR FIELD AT $10.00 PER WEEK

Special offer for June, July and August

We will guarantee to teach a student to fly and successfully operate an airplane by himself, regardless of the number of flying hours required, and further, to furnish an airplane, free of charge, for the period of one hour for practice flights.

The flying school of the Robertson Aircraft Corporation is one of the oldest and best known in the United States. All of the instructors are ex-army aviators with wide experience and the equipment is the best that money can buy. The flying field is approximately six miles from the city of St. Louis and is easily accessible by railroad, street car and hard surfaced roads. It is the largest and best privately owned field in the country and the International Air Races of 1923 were held there.

Our course includes thorough flying training as well as complete instruction in the over-haul, care and maintenance of both the airplane and motor. The time within which one can learn to fly, varies with the individual; eight to ten hours of dual instruction, stretched over a period of ten days to two weeks should complete the most stubborn case, and from then on, the refinements of the art can be gained only from experience. Commercial aviation is a rapidly growing industry. Don't delay! Enroll now!

ROBERTSON AIRCRAFT CORPORATION

ST. LOUIS FLYING FIELD, ANGLUM, MO.

Valspar goes to the Arctic—

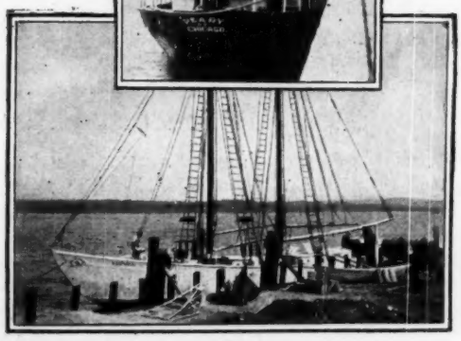
On June 20th the MacMillan-Navy expedition set forth from Wiscasset, Maine, on its perilous mission to the North Pole.

Using Axel Heiberg Land as a base for the Loening Amphibian planes, flying trips will be made over the great unexplored Arctic domain. Loening Amphibians were selected because they can be changed instantly from land-bird to sea-bird.

Valsparred, of course! For, like so many other leading designers, the Loening Company knows that no other varnish can equal Valspar in service and protection. Constant exposure to ice, snow, rain, blizzard, oil and gasoline—Valspar withstands them all. And due to its absolute waterproofness, Valspar is the one varnish that never turns white.

Commander MacMillan, speaking at Boston, Mass., before his departure.

Lowering one of the Loening Amphibians on board the steamer Peary.



Right: The Bowdoin, which will serve as headquarters. Photos by P. & A.

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White

Two of the three Loening Amphibian planes to be used on the expedition.

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Trade Mark

Queer Cargoes

ON the floor of the Glenn L. Martin Plant there stands a small flyer which attracts very little attention among the bigger and more powerful Bombers.

The moment it comes in from a flight it is inspected, tuned-up, refueled, and put in perfect condition for instant emergency.

Its cargoes are unique—a big manufacturer suddenly finds himself short on a certain shipment of bolts or stampings, or needs parts for a broken air compressor—can we bring a supply at once from a city 500 miles away? — we can, and do.

Chicago's greatest newspaper wants a photograph in a tearing hurry;—out goes the little plane, with a single slip of cardboard for freight.

For more than a year this little Martin Plane has maintained an unblemished record for service. Speedy—Reliable—and as safe as a church.

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16 of the WHIRLWIND engines are being used this year by Huff-Daland Dusters, Inc., in their dusting planes.

For flying close to the ground with heavy loads in small, tree-surrounded fields and with low operating costs, Huff-Daland Dusters, Inc., chose WHIRLWIND engines.

WRIGHT AIR-COOLED ENGINES DECREASE THE COST OF FLYING!

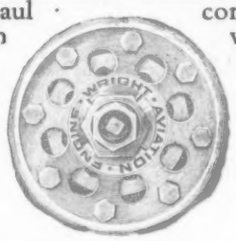
THROUGH four years of continual production with steadily improving manufacturing methods Wright 200 H.P. air-cooled engines have been brought to a point where the selling price is low as compared with *any type* of new gasoline engine and extremely favorable in the case of new *aviation* engines.

Nor is the reasonable first cost the only factor. The durability of the Whirlwind Engine has been sufficiently proved so that at least 300 hours can reasonably be anticipated without overhaul of any kind, and the facility with which inspection adjustments and minor repairs can be made without engine removal prevents the loss of valuable flying time.

The elimination of maintenance cost and danger liability of water radiation systems and the decrease in cost of spare parts due to the unit construction of the engine add still other factors to the decreased cost of flying.

Peru, Brazil, Cuba, Canada and other foreign governments are using Wright Whirlwind Engines. The commercial possibilities of these engines are exemplified in the recent installation of sixteen Whirlwind Engines in the planes of Huff-Daland Dusters, Inc., Georgia, who are taking important contracts for fruit tree and cotton boll weevil dusting. Impartial aeronautical and industrial engineers have decided that a considerable saving can be made by using air-cooled engines.

Bulletin No. 8-A containing a general description and technical information will be forwarded on request.



WRIGHT AERONAUTICAL CORPORATION
Paterson, New Jersey, U. S. A.

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